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Bull Sheet printed by Ever-Redi Printing, 5100 East Ave., Countryside, IL 60525.

The **Bull Sheet** is published once a month. All articles are required by the 10th of the month to make the next issue. Advertising is sold by the column inch, by the quarter page, half page, and by the full page. All artwork to be finished and in black and white. Circulation is over 500 issues per month.



President's Message

I would be remiss if I didn't mention the weather since it has played a big role in all our lives this summer. The extreme heat and humidity has caused us problems comparable to 1983. In many respects, it has been the worst summer in ten years. But what has happened to us is now in the past. We must regroup our resources, learn from our past experiences, and continue to keep the best courses found anywhere. We have this fall to recover from the ravages of summer and prepare for an early winter. I think all of us are thankful the cool, fall weather is upon us.

The weather has seriously affected the Western Open at Butler National this year. The week before the tournament, Oscar Miles had recorded 11.5 inches of rain in three days. One-third of the course was submerged, yet, all plans for keeping the tournament at Butler were secured. We want to commend Oscar, his grounds crew, and the numerous volunteers from area clubs for a gallant effort in preparing the course. The Western Open and Superintendent Oscar Miles received local and national publicity through newspapers, radio, and television. This favorable publicity has reached virtually millions of people. It has increased the public's awareness of the superintendent's plight and our role in golf course management has been clearly exemplified. We have received more recognition and respect during the past three weeks than in recent years. So, from all the bad news this summer comes a little sunshine for all of us.

We have to apologize for the late mailing of the membership directory this year. We have had trouble getting it printed and computer problems which have delayed the mailing process. Hopefully, by the time you read this, you will have received the new directory. I would also like to remind everyone about the I.T.F. Golf Outing scheduled for Sept. 28. This is a big annual fund-raiser for I.T.F. and M.A.G.C.S. will be presenting a donation to I.T.F. for turfgrass research.

James E. Evans

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A Local Place of Interest

by David Behrman, CGCS
Deer Creek Golf Club

For those of you who are of the opinion that the University of Illinois Turfgrass Field Day is not worth the trip because, "they do the same thing every year". I suggest you take another look.

As you begin your trip down I-57, the first thing you will notice is that special interest groups concerned about accessibility of the turf plots have raised the speed limit to allow a more timely arrival.

Once on the scene a variety of changes are noticeable, dependent upon when your last visit was. The rows of columnar maples are now some thirty feet tall, the bent grass plots have been moved up close to the test station, mowing practices reflect the new age; thanks to equipment donations, and there are more scientific minds than ever working to make our jobs easier.

As I began my tour the first stop was the crabgrass field tests. Of course if you do not have any crabgrass problems this year, who cares. For me, it was interesting to note that there were a few preemergent materials that worked this year. I also witnessed excellent results from some new experimental chemicals. As for postemergent control we all need more rate information and wouldn't you know they had that too.

Stop two was plant pathology. Analysis of patch disease, fungicide field trials (offering real results not sales pitches), and a new venture to determine nematode threshold levels. Here it was a pleasure to meet Dr. Tom Melton our state turf nematologist. He is one of those friends you hope you never need.

Next we heard from Roscoe Randall, reporting on insects and their whereabouts in the state. It seems that the beetles are only attacking non-ITF member courses.

Moving on we see field trials for bluegrass, ryegrass, turf type fescues, and fairway bent blends. Once you have decided your personal preference, you will find that computerized establishment recommendations are just over the horizon.

As you can see I could go on and on and never mention everything there is to see. Anyway, I would not want to hear next year, "Why go to U of I, Behrman wrote about everything last year."

Oh yeah, one last thing — Murphy's hasn't changed a bit, but that's another story.

U of I Field Day

by Tony Meyer, Retired Supt.
(but still active)

August 6, 1987 was the University of Illinois Turfgrass Field Day at the Ornamental Horticulture Research Center. I realize it is not always possible for a superintendent to attend, as I know of two who had all intentions of attending, when the day before other commitments came up preventing them from being there.

There were nearly 200 present, 90% lawn care people and 10% Superintendents, Sod Nurseries and Jobbers. I believe most of us are well acquainted with fungicides, as some of the newer ones on the market the last few years, seem to be doing a good job.

Dr. Hank Wilkinson and Dr. Randy Kane are working on Patch diseases, which are caused by soil fungi, living in the sod, and there is no single control procedure to get satisfactory results. I am sure we will hear and learn more about this in the future. The analysis of soils for the kinds and population of nematodes that cause diseases in the root zone of plants is on the increase. They explained about the ones that enter the grass plant root, and the ones that pierce it, causing damage and weakening the plant, subjecting it to other diseases.

Dr. Tom Fermanian and Jean Haley showed us the newer pre-emergence crabgrass control evaluation study and Pro-diamine 65WDG that will be marketed as Blockades, which looks very promising to be the best so far. The postemergence program is very interesting also, and Acclaim seems to be the most effective, but rate and timing of applications are still being evaluated. Dr. Roscoe Randall did a fine job on insects.

More work is being done on turfgrass varieties, and different blends plus other projects too numerous to mention. The research personnel at the University certainly appreciate the support of the Illinois Turfgrass Foundation, and they say there is no question that without the I.T.F. there would be no research farm facility. It is sad to hear that there will be no raises in salaries, at the University, and the personnel asked us to write our State Representatives for help, otherwise they may be looking elsewhere for better wages.

I certainly enjoyed the day and hope that future field days will be better attended by Golf Course Superintendents.



The "catch" from a 6" drain tile — a 28' willow root



From the Lakes to the Mountains — 1987 Edition

by James M. Latham, Director
Great Lakes Region, USGA Green Section

*"There are in nature neither rewards nor punishments —
there are consequences."*

Robert G. Ingersoll

It's really too early to speculate on just what name tag will be placed on this golf/growing season. 1986 was the year of the Black Layer. Maybe 1987 will be called simply The Longest. Golfers may actually wear themselves out if we are blessed with normal fall weather. Lord knows they are wearing out enough turf this year. But without them there wouldn't be a need for us. Just what the consequences will be depends on the quality and quantity of turf and soil rehabilitation provided this fall.

It's been a rather weird season. Lack of snowcover in many areas last winter cost some courses a goodly amount of green grass this spring. The old fashioned techniques worked best to prevent desiccation. Greens were "adequately" topdressed after the last application of snowmold preventers. Later, when no snow cover came, the thinking of superintendents hauled water to keep some kind of moisture (ice, of course) on the surface. Cal Polsean, at Westward Ho in Sioux Falls recorded 400 manhours were needed to supplement the 0.5" of precipitation over the winter.

Winter play got a good test at the Minnehaha Club there. They recorded 700 rounds of golf over the winter with no **apparent** turf problems on sand-topdressed greens by early June. **BUT**, play had been stopped on March 1, and not resumed until the greens were fully thawed. Superintendent Gene Reiter hauled water, too.

On the other side of the coin, a Minnesota club had no such restriction, and in mid-June the footprints of two golfers were still visible (dead grass), complete with heel and top prints. Just two people playing one day interfered with the play of the rest of the membership for over two months!

The grass greened up early this year, but didn't get any real growth until the warm rains came along in May. The primary spring complaint was rough greens. The 75 degree days were balanced by the 35 degree nights to get a zero score on spreading, fill-in growth. Some courses, though, were still recovering from the fall rains — like the washout at Kohler and the 30" rain that fell at Bay City, Michigan. Now, the Minneapolis/St. Paul area is starting over again with 21" within 7 days beginning July 27 (interlachen gauge).

This season has been, in all but a few areas, a report on the effectiveness of irrigation systems. It should be a great selling year for multiple row irrigation. Between those toasty roughs came the centerline slops and the occasional **Pythium** spots and ruts.

(cont'd. page 6)

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Enough talk about the weather. The lightweight, floating head mowers are getting the best of *Poa annua* in fairways. The bent has really moved out this year, especially where superintendents have been able to adequately control the irrigation. Where the bent is well scattered through an area it can do its own thing without chemical help — but with patience.

Plant growth regulators have taken up the anti-Poa fight with a vengeance and are performing very well in bent, blue and ryegrass fairways. The only ill effects noted so far occurred when a crosswind blew one material around quite a bit and when a heavy rain washed another application into surface drainage areas. Good results were obtained on spring applications to fall seeded bent following turf eradication. There are still lessons to be learned, but the outlook is good. And there are other materials yet to be fully tested in this area.

None of these things are free and now that budgeting time is nearly upon us, let's look at some numbers. I note from the new Pannell-Kerr-Forster report that the maintenance cost per hole on Midwest courses in 1986 was \$19,610. That's about \$353,000 for 18 holes, a 9% rise over 1985. The national average was \$21,101 per holes, up 7.8% from the previous year. Other areas — East, \$17,607 per hole — up 11.8%; South, \$20,568 per hole — up 7.8%; the Far West, \$28,177 per hole — up 3.5%. The numbers are interesting, but their meaning depends on what one is trying to prove.

An entomological note: The mild winter certainly helped increase the golf course bug problem this year. Just note the number of strange yellowed blotches on greens — with a perfect green outline of a foot right in the middle. It's been a great year for cutworms and ants, too.

The Good Turn of the Year: Superintendent Vern Burks in Great Falls hired 30 Boy Scouts to transplant aerator plugs from the surviving parts of greens to the aeration holes on high mounds where the turf was lost to desiccation. His green cover, by the way, was a hydromulch fiber that had been successful for the previous nine years. This time it blew off.

The observation of the season: The development of grain on fairways, from tee toward the green, which can be worrisome at the start of a backswing. Golf cars. So get out the vertical mowers to go with the aerators.

And the worry of the year: Spots on some greens that look very much like the C-15 disease ... except the grass isn't C-15. At this writing, tests are being rechecked at U/W and MSU.

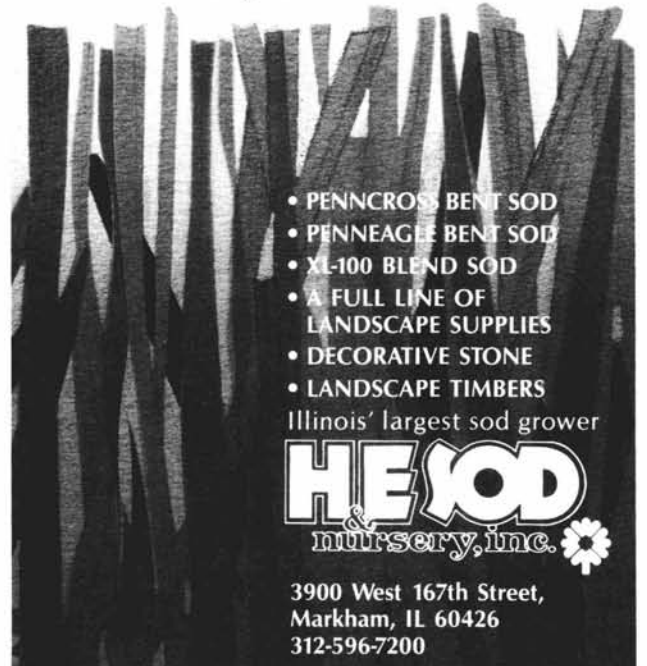
Remember When? USGA Championships were played on greens mowed at 3/16 inch — only 10 years ago at the Womens Open at Hazeltine. Maintenance programs have, since then, given the players the best conditioned golf courses they have ever seen. There are two operations responsible for most of this — light and frequent topdressing with properly sized sandy material (straight or mixed) and lightweight mowing of fairways. Both have their drawbacks but none are insurmountable. Both require additional operations but higher quality usually demands a higher price. Both demand enlightened operational management and that's why continuing education is so important to all of us today. Remember —

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Black Layer — Anaerobiosis is the Condition but Sulfur is not the Cause

by Houston B. Couch

Professor of Plant Pathology

Virginia Polytechnic Inst. & State University

If the black layer problem of bentgrass greens that is being reported from various areas of the country is going to be effectively dealt with, research must be addressed to correcting the condition that is causing the decline and death of the plants, rather than being preoccupied with trying to reproduce the "black layer" pattern that sometimes accompanies it. The condition that is causing plant death is anaerobiosis, the black layer is the "by-product" of this activity.

Anaerobiosis is a dynamic series of events taking place in an oxygen depleted environment. When the soil becomes anaerobic, there are significant changes in both the form and solubility of certain nutrient elements. In their reduced state, these elements may be taken up by the plant more rapidly than they can be metabolized, thereby becoming toxic. In addition, the root systems of plants do not function properly in anaerobic soils. Their ability to absorb water and nutrients may be reduced significantly. Also, anaerobic microorganisms growing in the soil can produce toxic metabolites that cause either an outright death of the roots or an unthrifty growth of the overall plant.

While this problem is receiving more attention that it did in times past, anaerobiosis of bentgrass greens to the point of

(cont'd. on page 8)

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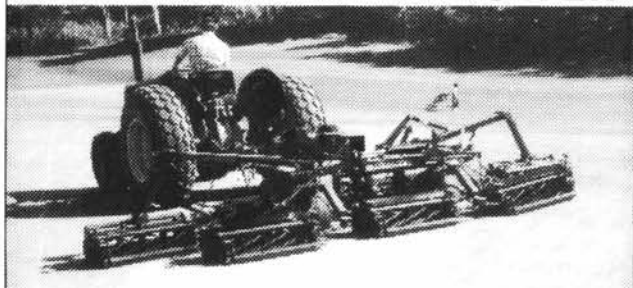
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(Black Layer cont'd.)

decline and dying-out is not new. For some 30 years, I have observed this condition in various stages of severity on bentgrass putting greens in a wide range of locations in United States. During the past two years, I have diagnosed cases of acute anaerobiosis in plugs from greens with both predominantly sand and predominantly soil construction.

In considering the dynamics of anaerobiosis and how to control it, one must understand that sometimes a black layer accompanies the condition, sometimes it doesn't. Sometimes, there is a strong odor of hydrogen sulfide, sometimes there isn't. Sometimes there is a high population of algae on the surface of the green, sometimes there isn't. The one thing all of these situations have in common is an anaerobic condition caused by the filling of the soil's pore spaces with water.

This water accumulation can be the result of prolonged periods of rainfall, or impaired infiltration brought on by (i) problems with the initial construction or (ii) an aerification program that included improper selection of sand type for the topdressing.

Anaerobiosis can be rapidly accelerated by an accumulation of algae on the surface of the green. Algae proliferate very rapidly on high sand content greens. This is probably due to (i) the fact that they grow better on wet, light, sandy soils, (ii) the microbial competition is not as great as that found in predominantly soil mixes, (iii) irrigation practices on high sand content greens are oftentimes excessive, and (iv) there is a wide amplitude in the "swing" of availability of various nutrient elements.

Algae produce complex polysaccharides that have the consistency of gelatin. This material can move downward in the profile, plug the pores in the soil, and thus impede the infiltration of water. Not only do these polysaccharides contribute to the development of the anaerobic condition in the soil, but they can also serve as a growth medium for anaerobic microorganisms. Algae, then, can be an important factor in the development of anaerobically-induced decline of turfgrass.

An article entitled "Black Layer Formation in Highly Maintained Turfgrass Soils" appearing in the June 1987 issue of Golf Course Management theorizes that sulfur is the cause of anaerobiosis. It is the opinion of the authors that sulfur, not excess water, initiates the anaerobic state in the soil, and that sulfur (in the form of hydrogen sulfide) is the cause of the death of the plants. Their premise centers primarily around the fact that sulfur does have the potential for developing a blackened condition in the soil, and that in their field trials, they were able to produce black layers with sulfur treatments.

Their hypothesis assumes that (i) sulfur at presently used rates will induce an anaerobic condition in the soil, (ii) sulfur at presently used rates will produce black layers in the soil, and (iii) all conditions of anaerobiosis in soils lead to the formation of black layers. None of these assumptions is correct. In fact, the results of their tests showed that sulfur applications within the normal use range does not produce black layers.

Their experimental design consisted of applying sulfur at two separate rates, 1 pound and 5 pounds per 1,000 square feet. Seventy five percent of the experimental units that had been treated with 5 pounds of sulfur per 1,000 square feet developed the black layer. None of the experimental units treated with 1 pound of sulfur per 1,000 square feet developed black layers.

Where sulfur and products containing sulfur are concerned, there is no published scientific evidence that elemental sulfur used at the rates currently recommended, or that the levels of sulfur in fertilizers currently in use in turfgrass management, either cause or contribute to the development of anaerobiosis. Sulfur is not a factor in the development of anaerobiosis. This means, then, that sulfur at the rates currently recommended will not **induce** anaerobiosis, and refraining from using sulfur will not **reduce** anaerobiosis.

The impact of anaerobiosis on plant growth can be either chronic or acute. It can exist in soil long before there is strong evidence of affected plant growth. It can exist without producing black layers. Prevention of the problem is accomplished by close monitoring of the infiltration rates of the greens. When the rate begins to drop, even though it may not appear to be significant, direct measures should be taken to correct the matter.

When it has been determined that anaerobiosis has developed, steps should be taken to increase the oxygen levels in the root zone. This means following a watering program that allows the soil moisture to be extracted well below field capacity between irrigations. It means aerification — including deep aerification if drainage barriers exist. It may also mean installing supplementary drainage for the greens.

Another important aspect of preventing anaerobiosis from developing to the acute stage is the control of surface algae. At the present time, the only pesticide that can be used on putting greens for algae control is mancozeb (Manzate, Fore, Tersan LSR). This material is effective in the control of Helminthosporium-incited diseases, and is also effective in reducing the impact of Pythium blight. Its inclusion in the spray schedule, then, can serve more than one purpose.



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